Before the paragraph bridging pages 6 and 7, please insert the following section header:

D4 DETAILED DESCRIPTION

Before the paragraph bridging pagės 6-7, please add the following paragraph:

D5 Figure 3 illustrates injectors at three different locations relative to a throat controlled by a distribution device.

Please amend page 4, 7th paragraph as follows:

D6 At least one of the aforesaid objects of the present invention is achieved through a rocket engine nozzle comprising a system for controlling jet separation, wherein said control system exhibits a plurality of separation triggering elements arranged in such a way as to generate, from mutually spaced initiation orifices, distinct zones of jet separation, so as to form a three-dimensional separation of the flow.

Please amend page 6, 3rd full paragraph as follows:

D7 The injection orifices of the injector of the external stabilizing device are preferably uniformly distributed over the perimeter of the wall of the nozzle. They are advantageously two in number (diametrically opposed) or three in number (distributed at around 1200 over the perimeter if the nozzle).

Please amend page 7, 2nd full paragraph as follows:

The flow separation which is generated by these orifices 5 (i.e., injection points), does not exhibit axial symmetry, but on the contrary it is three-dimensional. This is because each of the orifices 5, represented here as three in number and distributed uniformly at 120^0 around the contour of the body 4 of the nozzle, induces a region of separation 6 of the stream exiting the nozzle. Owing to the determination of a limited number of orifices 5 which induce an equal number of separation regions 6, the position of the points of initial separation is not indeterminate and this makes it possible to solve the problem of instability.

D 8

Please amend page 7, 3rd full paragraph as follows:

Furthermore, by reason of the uniform distribution of the orifices 5 around the circumference of the nozzle body 4 in the plane 7, the resultant of the lateral forces which are exerted on the nozzle and which, in the prior art is unstable, remains close to the axis of the nozzle.

D 9

Please amend the paragraph bridging pages 7 and 8 as follows:

In theory, the number of orifices 5 could be equal to just 2 so as to make it possible to maintain a symmetric thrust for the nozzle. The number of three orifices 5 seems however to be a preferable choice in order to avoid accidental separation of half the nozzle which could arise on ignition.

D 10

Please amend page 8, 1st full paragraph as follows:

Moreover, a higher number than three injection points may be envisaged, but this does not afford any appreciable advantage. In any event, the number and the spacing of the orifices

D 11

D 11

must be chosen in such a way as to avoid any continuity of jet separation, which would amount in fact to the operating conditions equivalent to that of a uniform ring (see the aforesaid American patent US 3 925 982).

Please amend the paragraph bridging pages 8 and 9 as follows:

D 12

The injection orifices 5 which direct a secondary stream radially inward according to the invention create an obstacle to the main jet locally, thereby creating an arc-shaped shock wave in respect of the incident supersonic jet. This arc-shaped shock zone interacts with the boundary layer, in which it creates an increase in pressure just upstream of the orifice 5, thereby inducing local separation of the boundary layer at the points 9. Given that the boundary layer was already under conditions under which it was near to spontaneous separation, the jet of the nozzle cannot reattach itself to the wall of the body 4 and the separation of the boundary layer spreads so as to adopt for each orifice 5 a conical configuration as shown by the dashed drawing of the separation regions 6 in Figure 1 The vertex of the cones 6 is constituted by the points 9 of initiation of jet separation. The three orifices 5 create, starting from the initiation, points 9, three substantially identical cones 6 which are apt to remerge downstream so as to form an entirely separated jet at the exit 8 of the nozzle.

Please amend page 9, 1st paragraph as follows:

D 13

Given that the points of initiation 9 where the jet separations occur are imposed geometrically by the position of the three orifices 5, the symmetry of revolution is broken and the points 9 of initiation of the separation are stable over time. The shocks which are created due

D13 to the separation of the boundary layer relative to the wall of the body 4 also remain localized and the residual vibrations due to these shocks are of low amplitude, as are the residual unsteady forces.

Please amend page 10, 1st full paragraph as follows:

D14 These gases can be reinjected at a few orifices only into the divergent body 4 of the nozzle to achieve jet separation according to the invention.

Please amend page 10, 2nd full paragraph as follows:

D15 The present invention can be adapted to the Vulcain 2 engine with minimal modifications. It is sufficient to modify the injection ring so that it exhibits for example three orifices 5 instead of a uniform distribution of injection. Furthermore, the divergent portion 4 of the nozzle, which currently exhibits for the Vulcain 2 engine an area ratio R equal to 60 for a specific impulse of 433 seconds, could be replaced with a divergent portion exhibiting an area ratio R of the order of 140. The film-based cooling function could be replaced with radiative cooling, by virtue of a carbon/carbon nozzle extension known per se.

Please amend page 10, 3rd full paragraph as follows:

D16 For the Vulcain 2 engine, the value of Psep is of the order of 0.22 bar and the recommended location for siting the orifices 5 is the cross section for which the pressure is equal to 0.4 bar. This corresponds to a Mach number of 4 and an area ratio R of around 26. The location is not very different from the current location of the injection ring. The anticipated increase in the specific impulse is of the order of 12 seconds.

Please amend page 11, 3rd full paragraph as follows:

B17

Another solution is to arrange different orifices 5 which are activated in succession in such a way as to optimize the operation of the nozzle at each instant. A solution of this type has already been proposed, but for injection at continuous rings by the aforesaid patent US 3 925 982.

Please amend the paragraph bridging pages 12 and 13 as follows:

B18

The device for stabilization on blast-off is represented in Figure 2. It can be used independently or otherwise of the jet separation device. It implements a plurality of injection tubes 10 parallel or otherwise to the axis of the nozzle and arranged downstream of the nozzle exit 8 and directed toward impact points 12. These tubes 10 propagate fluid jets 11 in counter-current to the main stream, the points of impact 12 of these jets being situated slightly downstream of the throat 3 of the nozzle, for example a distance from the throat 3 equal to 0.1 Dl. These points of impact 12 distributed uniformly at one and the same distance from the throat 3 of the nozzle produce a similar effect to that of the orifices 5, with the difference however that the fluid, for example liquid nitrogen, which is projected creates a separation at each point of impact 12 through a mass entrainment effect along the boundary layer. The points of separation of the hot gases of the jet from the nozzle are stable by reason of one existence of the impact points 12. It is advantageous to effect this injection with liquid nitrogen, since the counter-current injection rate may be very high (for example 30 kg/s for each injection point for the Vulcain 2 engine) during the short instant which proves to be necessary. Furthermore, the liquid